



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/937,188	09/21/2001	Christine Connolly	013344-9027	6355

23409 7590 07/14/2006

MICHAEL BEST & FRIEDRICH, LLP
100 E WISCONSIN AVENUE
MILWAUKEE, WI 53202

EXAMINER

MISLEH, JUSTIN P

ART UNIT	PAPER NUMBER
----------	--------------

2622

DATE MAILED: 07/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/937,188	Applicant(s) CONNOLLY ET AL.	
	Examiner Justin P. Misleh	Art Unit 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 15 is/are pending in the application.
- 4a) Of the above claim(s) 16 - 30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 - 15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed April 25, 2006 have been fully considered but they are not persuasive.
2. Applicant argues, "Takahashi does not teach, describe, or suggest any correlation between the 'knee characteristic' and the actual aperture of the iris 2. Accordingly, Takahashi does not teach or suggest, among other things, 'establishing a point at which a graph of input light intensity against camera output voltage starts to deviate from a substantially linear characteristic, hereinafter referred to as establishing the knee; and restricting the amount of light incident on all sensor elements of the camera such that the maximum output corresponds to a voltage at, or below, the knee,' as claimed in claim 1."
3. The Examiner respectfully disagrees with Applicant's position. Takahashi et al. disclose, in column 13 (lines 42 – 65), using a plurality of "exposure controlling parameters such as the iris aperture, shutter speed, and gain, corresponding respectively to the plural phototaking modes." However, Takahashi et al. disclose additional exposure controlling features, in column 13 (line 66) – column 14 (line 15), by effecting "control on the camera signal processing circuit 6" and the "image signal processing circuit 7" by varying the "non-linear conversion characteristic of the image signal level (knee characteristic of gamma characteristic) in the camera signal processing circuit 6" and by controlling "the characteristics of an aperture correction circuit for varying the image sharpness, and to add 'fading effect' or 'afterimage effect' to the image signal in the image signal processing circuit 7". Essentially, Takahashi et al.

Art Unit: 2622

provide at least five different exposure control methods including adjusting the iris aperture (via iris 2) and varying the knee characteristic (via processing circuit 6) which operate in combination with one another to effect total exposure control of the image pickup device.

4. Clearly, Applicant's allegation is erroneous; Takahashi et al. absolutely disclose a correlation between the knee characteristic and the actual aperture of the iris. Accordingly, Takahashi et al. disclose, among other things, "establishing a point at which a graph of input light intensity against camera output voltage starts to deviate from a substantially linear characteristic, hereinafter referred to as establishing the knee; and restricting the amount of light incident on all sensor elements of the camera such that the maximum output corresponds to a voltage at, or below, the knee," as claimed in Claim 1.

5. Applicant additionally argues, "Sakai fails to teach 'measuring or calculating the output voltage of the camera ... At no point does Sakai teach 'establishing a camera offset by measuring or calculating the output voltage of the camera when substantially no light falls on any of its sensor elements, hereinafter referred to as establishing the offset,' as claimed in claim 1."

6. Again, the Examiner respectfully disagrees with Applicant's position. In fact, the only method Sakai et al. employ to establish "a camera offset" is by calculating the output voltage of the camera. Specifically, Sakai et al. captures a plurality of *optical black* (dark frames) and averages them to determine the *actual* (most accurate) representation of the camera output voltage (see column 4, lines 31 – 58). Essentially, Sakai et al. use the camera offset to reduce fixed pattern noises and virtually eliminate random noises by calculating the output voltage of the camera (see column 1, lines 31 – 35 and column 5, lines 43 – 49).

7. Again, Applicant's allegation is erroneous; Sakai et al. absolutely disclose measuring or calculating the output voltage of the camera. Accordingly, Sakai et al. establishing a camera offset by measuring or calculating the output voltage of the camera when substantially no light falls on any of its sensor elements, hereinafter referred to as establishing the offset.

8. Finally, Applicant appears to traverse the Examiner's use of Official Notice that both the concepts and advantages of providing a white reference representing know maximum light (saturation) in the image field via a white reference tile are well known and expected in the art. Applicant specifically states, "To the extent that this position is relied upon by the Examiner, the Applicants respectfully request that the Examiner provide a specific prior art reference that teaches this subject matter."

9. In response thereto, the Examiner is currently citing Madden et al. (US 5 786 823). Madden et al. specifically teach, as shown in figure 2 and as stated in column 10 (lines 11 – 37), a reference viewing environment that includes a "white reference" and an image pickup device (14) for capturing an image of the environment. The invention disclosed by Madden et al. is directed towards color reproduction of input images. Thus, the Examiner maintains that both the concepts and advantages of providing a white reference representing know maximum light (saturation) in the image field via a white reference tile are well known and expected in the art.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. **Claims 1 – 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al. in view of Sakai et al.

12. For **Claim 1**, Takahashi et al. disclose, as shown in figure 15 and as stated in columns 13 (line 42) – 14 (line 15), a method of calibrating a color monitoring system so as to compensate for non-ideal real camera characteristics, the method comprising:

establishing a point (“a”, “b”, or “c”) at which a graph of input light intensity against camera output voltage starts to deviate from a substantially linear characteristic, hereinafter referred to as establishing the knee (specifically, see column 14, lines 5 – 15); and

restricting the amount of light incident on all sensor elements of the camera such that the maximum output corresponds to a voltage at, or below, the knee, and lower light intensities are all within the range of linear operation (specifically, see column 13, lines 52 – 57).

While Takahashi et al. disclose a method of establishing a knee point and such that output signals conforms to a linear characteristic; Takahashi et al. does not disclose establishing a camera offset by measuring or calculating the output voltage of the camera when substantially no light falls on any of its sensor elements, hereinafter referred to as establishing the offset.

On the other hand, Sakai et al. also disclose a method for compensating real camera characteristics. More specifically, Sakai et al. disclose, in accordance with figures 1 and 2 and column 4 (line 29) – column 5 (line 49), an image processing apparatus that at least includes a shutter (2) and a photoelectric conversion unit (3) which includes a plurality of pixels.

Furthermore, Sakai et al. disclose that when a user operates a release button, the shutter (2) is opened and the plurality of pixels of the photoelectric unit (3) captures an image of the subject

that has passed through the lens (1) and the opened shutter (2). After the image of the subject has been captured, the shutter (2) is closed, such that light passing through the lens does not pass through the shutter (2) to the photoelectric conversion unit (3); hence, allowing the photoelectric conversion unit (3) to capture a dark image that represents noise. The noise capturing operation, while the shutter is closed, is repeated two or more arbitrary times such that a plurality of dark images are captured so that an averaged dark image can be calculated to represent the average noise of the photoelectric conversion unit (3). The averaged dark image is an “offset” that is subtracted the subject image to produce a final image with reduced noise. Clearly, Sakai et al. teach establishing a camera offset by measuring or calculating the output voltage of the camera when substantially no light falls on any of its sensor elements, hereinafter referred to as establishing the offset.

As stated in column 1 (lines 30 – 35), at the time the invention was made, it would have been obvious to one with ordinary skill in the art to have included establishing a camera offset by measuring or calculating the output voltage of the camera when substantially no light falls on any of its sensor elements, hereinafter referred to as establishing the offset, as taught by Sakai et al., in the method, disclosed by Takahashi et al., for the advantage of reducing fixed pattern noises without increasing random noises.

13. As for **Claim 2**, Sakai et al. teach, as stated in column 4 (lines 10 – 30), that when a user operates a release button, the shutter (2) is opened and the plurality of pixels of the photoelectric unit (3) captures an image of the subject that has passed through the lens (1) and the opened shutter (2). After the image of the subject has been captured, the shutter (2) is closed, such that light passing through the lens does not pass through the shutter (2) to the photoelectric

conversion unit (3); hence, allowing the photoelectric conversion unit (3) to capture a dark image that represents noise. Therefore, Sakai et al. teach that the offset is established on a periodical basis.

14. As for **Claim 3**, Sakai et al. teach, as stated in column 4 (lines 10 – 30), that when a user operates a release button, the shutter (2) is opened and the plurality of pixels of the photoelectric unit (3) captures an image of the subject that has passed through the lens (1) and the opened shutter (2). After the image of the subject has been captured, the shutter (2) is closed, such that light passing through the lens does not pass through the shutter (2) to the photoelectric conversion unit (3); hence, allowing the photoelectric conversion unit (3) to capture a dark image that represents noise. Therefore, Sakai et al. teach that the offset is established whenever an image capture operation for capturing a desired image is carried out.

15. As for **Claims 4 – 7**, the Examiner notes that the features of these claims are inherent to what is actually required by the claim language. In other words, closing the camera iris (Claim 4), capturing a black image (Claim 5), or extrapolating measurements of known black reflectance (Claim 6) will always generate a point of zero light intensity. In regards to Claim 7, the captured image will always eventually have a known point of reflectance – specifically, at the time of image output. In regards to these claims, the claims do not actually require performing the respective operations to set said point. Thus, since the claimed features are inherent to the claim language; they are equally inherent to the combination Takahashi et al. and/or Sakai et al.

16. As for **Claims 8 and 9**, while Takahashi et al. in view of Sakai et al. teach providing a black reference representing known zero light specifically when no light is allowed to impinge

upon the image sensor; Takahashi et al. do not disclose providing a white reference representing know maximum light (saturation) in the image field via a white reference tile.

However, **Official Notice** (MPEP § 2144.03) is taken that both the concepts and advantages of providing a white reference representing know maximum light (saturation) in the image field via a white reference tile are well known and expected in the art. At the time the invention was made, it would have been obvious to one with ordinary skill in the art to have provided a white reference representing know maximum light (saturation) in the image field via a white reference tile for advantage of ensuring the subject has proper color balance such that the subject can be reproduced precisely in an image display unit without being affected by the color characteristic of the camera.

The Examiner has cited Madden et al. as documentary evidence of this asserted fact. See *Response to Arguments* section above for details.

17. As for **Claim 10**, Takahashi et al. disclose, as shown in figure 15 and as stated in column 14 (lines 5 – 15), wherein restricting the camera to operate within the linear region is achieved by reducing the camera aperture by closing the iris to a predetermined knee such that the output voltage when measuring the source of maximum light intensity corresponds to a camera output voltage at or below the knee.

18. As for **Claim 11**, Takahashi et al. disclose, as shown in figure 14 and as stated in column 14 (lines 5 – 15), wherein the iris is restricted so as to give an appropriate camera output voltage, which is a proportion of a full scale value.

19. As for **Claim 12**, Takahashi et al. disclose, as shown in figure 14 and as stated in column 14 (lines 5 – 15), the gamma characteristic curve showing the voltage output by the image sensor

versus the input light. On a gamma characteristic curve, the uppermost level represents saturation (maximum white) and the lowermost level represents no light (maximum black). Furthermore, Takahashi et al. disclose that each curve with respective knee point (“a”, “b”, and “c”) to meet at the uppermost level representing saturation. In other words, the knee point is optimized such that the curve is linear from the uppermost level (saturation) to the lowermost level (black image). Thus, Takahashi et al. disclose wherein restriction of the iris is arranged to ensure that a perfect white reflector registers at the top of the linear region and to then scale

20. As for **Claim 13**, Takahashi et al. is directed to calibration prior to, during, and after image capture wherein Sakai et al. is directed to real-time correction during image capture. Therefore, Takahashi et al. in view of Sakai et al. teach that the knee (Takahashi et al.) is established less frequently (once versus every image capture) the offset (Sakai et al.).

21. As for **Claims 14 and 15**, the Examiner notes in both Claims 14 and 15, the claim language is written broadly enough such a plurality of print runs directly corresponds to a plurality of image captures. Moreover, as stated in column 13 (line 42) – column 14 (line 15), Takahashi et al. disclose establishing the knee both at the time of selecting a phototaking mode before images have been captured and during image processing, via look-up tables (19a and 19b), after a plurality of image captures.

Conclusion

22. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

23. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Justin P Misleh whose telephone number is 571.272.7313. The Examiner can normally be reached on Monday through Friday from 8:00 AM to 5:00 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Vivek Srivastava can be reached on 571.272.7304. The fax phone number for the organization where this application or proceeding is assigned is 571.273.3000.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JPM
July 5, 2006



VIVEK SRIVASTAVA
PRIMARY EXAMINER